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FUNGA PHOTOGRAPHICA.

BOLETALES I: *CONIOPHORACEAE*,
HYGROPHOROPSISACEAE,
PAXILLACEAE, *SERPULACEAE*,
TAPINELLACEAE BOREALES

PETROPOLI 2019

**Funga photographica.
Boletales I: Coniophoraceae,
Hygrophoropsidaceae,
Paxillaceae, Serpulaceae,
Tapinellaceae boreales**

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nations, new genus, paxilloid fungi, *Penttilo-
myces*, photos of fungi, Rejo Penttila, *Serpula
lacrymans*, timber wood, wood-inhabiting
fungi

Summary: The opening series aims to pub-
lish the authors' photographs of different
years. The families *Coniophoraceae*, *Hygro-
phoropsidaceae*, *Paxillaceae*, *Serpulaceae*,
and *Tapinellaceae* are exhaustively charac-
terized and 32 photo tables are presented for
boreal taxa of the families in question. New
genus *Penttilamyces* was described and five
new combinations were made.

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9586.

NOMENCLATURAL NOVELTIES

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FOREWORD

The opening of series “Funga photographica” aims to publish the authors’ photographs of different years, which accumulate faster than monographic taxa elaboration. Meanwhile, the collection of photos of macromycetes characteristic from a morphological point of view is extremely useful for monographic studies as well as manuals compilation.

The structure of material presentation is rather simple in the present series. Photo collections, striving to cover the entire spectrum of a polymorphism of one or another species as far as possible are accompanied by the data on geographic area of the find and substrate on which the fungus was recorded. If the taxon is rare and represented by scarce herbarium specimens, the label data are provided.

The fungi of the order *Boletales* represent rather good subject for photo presentations, since they have highly expressive habitus of basidiomata. This issue is dedicated to the *Boletales* representatives to one degree or another related to the wood. Representatives of the families *Coniophoraceae*, *Serpulaceae*, and *Tapinellaceae* are true xylotrophic fungi that inhabit dry, fallen and buried wood, stumps and roots. They cause brown rot, leading to the rapid oxidation of cellulose by the Fenton mechanism. Among these families the most harmful house fungi are disseminated. Likewise, among the representatives of the families *Hygrophoropsidaceae* and *Paxillaceae* there are wood-inhabiting fungi, but most of species are soil-inhabiting and form ectomycorrhizae. However, these fungi are also capable of decomposing cellulose via the Fenton mechanism.

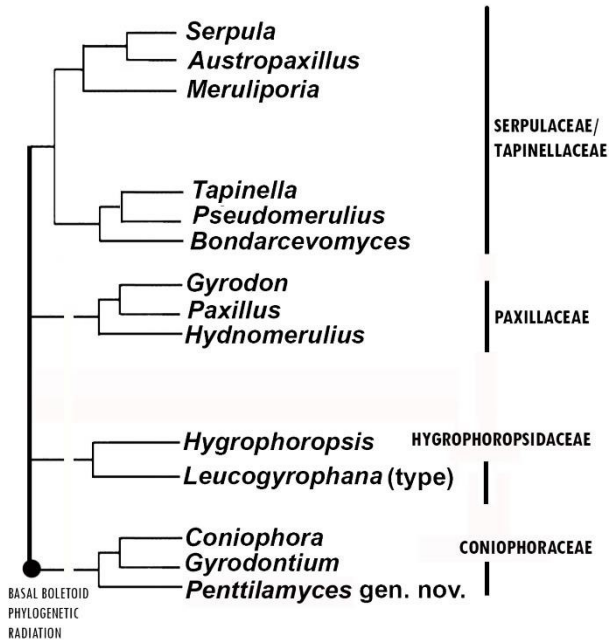
Highly expressive part of basidiomata in outlined families is their hymenophore. In pileate forms it is lamellate with a tendency to form multiple anastomoses. Upon maturation, the gills, which initially have a cream-yellowish color, become bright-colored due to the formation of thick-walled basidiospores with pigmented wall. In pilei with a dorsal attachment, the radial orientation of

gills stays poorly visible due to strong development of anastomoses with the formation of merulioid hymenophore. However, in advanced taxa of wood colonizers the merulioid folds tend to disappear and hymenium becomes almost smooth.

In the boreal belt of planet, these fungi fulfill important functions, reducing the stocks of wood mortmass in the ecosystems of coniferous and mixed forests. Deposits of amorphous lignin remnants after brown rot processing form basic compounds of boreal soils. In addition, some of these fungi are producers of redox-active pigments, which recently began to be used in oncology as inhibitors of growth factors receptors of cancer cell. *Paxillus*-syndrome is also known in medicine. This is autoimmune reaction that occurs with repeated use of swine fungus and leads to the death of hypersensitive patients.

Most of the photographs in this issue were taken by N.I. Kalinovskaya and A.G. Myasnikov. I.V. Zmitrovich compiled taxonomy and reference materials and also provided some photos of the fungi of genera *Paxillus*, *Tapinella*, *Serpula*, and *Coniophora*. The photo of *Gyrodon lividus* was kindly presented by Alexander Dementyev. The authors also very grateful to Paul Kirk for his kind attention.

PHYLOGENY



The results of repeated BLASTn searches on GenBank nLSU gene similarities within wood-inhabiting (and *Paxillus*-like) taxa of *Boletales* (<https://blast.ncbi.nlm.nih.gov/>).

TAXONOMY

I. **CONIOPHORACEAE** Ulbr., Krypt.-Fl. Anfäng. 1(3): 120, 1928.

Wood-inhabiting, athelioid or merulioid, hyphae simple-septate or nodose-septate, basidia utriculate, basidiospores indextrinoid or weakly dextrinoid.

1. **Coniophora** DC. in DC. et Lamarck, Fl. Franç. Edn 3, 6: 34, 1815.

Basidiomata annual, totally effused, adhering the substrate, pellicular, with byssoid margin and subiculum; hymenophore as a concrete pellicular layer, even to warted-tuberculate, cinnamon or olivaceous-brown when mature; hyphal system monomitic, hyphae simple-septate or furnished by verticillate clamp connections; cystidia absent or present as cylindrical septocystidia protruding the hymenium; basidia utriculate, elongate, 2–4-spored; basidiospores ellipsoid to fusoid, with smooth two-layered brownish wall, CB+, IKI–; on wood of various conditions, causes a brown rot.

Type: *Coniophora membranacea* DC., Fl. Franç. Edn 3, 5/6: 34, 1815.

Species boreales: *C. arida* (Fr.) P. Karst., Not. Sällsk. Fauna et Fl. Fenn. Förh. 9: 370, 1868; *C. bimacrospora* Decock, Bitew et G. Castillo in Carlier, Bitew, Castillo et Decock, Cryptog. Mycol. 25(3): 264, 2004; *C. fusispora* (Cooke et Ellis) Cooke in Sacc., Syll. fung. 6: 650, 1888; *C. olivacea* (Fr.) P. Karst., Hattsvampar: 162, 1879; *C. puteana* (Schumach.) P. Karst., Not. Sällsk. Fauna et Fl. Fenn. Förh. 9: 370, 1868.

2. **Gyrodontium** Pat., Essai Tax. Hyménomyc.: 117, 1900.

Basidiomata annual, pileate to resupinate with a dorsal attachment, growing as large patches adhering the substrate, with cordonic margin and subiculum; hymenophore as ceraceous teeth field, olivaceous-green when mature; hyphal system monomitic, hyphae simple-septate or nodose-septate, CB+; cystidia absent;

basidia utriculate, 4-spored, without a basal clamp connection; basidiospores ellipsoid-cylindric, with smooth one-layered brownish wall, CB+, dextrinoid; on wood in warm regions of the world, causes a brown rot.

Type: *Hydnum henningsii* Bres., Bull. Soc. mycol. Fr. 6(1): XLVIII, 1890. = *Gyrodontium sacchari* (Spreng.) Hjortstam, Mycotaxon 54: 186, 1995.

Extraboreal genus.

New combination: *Gyrodontium arizonicum* (Ginns) Zmitr., Kalinovskaya et Myasnikov comb. nov. (IF 556846), basionym: *Leucogyrophana arizonica* Ginns, Can. J. Bot. 56(16): 1955, 1978.

3. **Penttilamyces** Zmitr., Kalinovskaya et Myasnikov
gen. nov. (IF 556847)

Basidiomata annual, resupinate, orbicular and adhering the substrate, with byssoid margin and subiculum; hymenophore as ceraceous merulioid (or almost even) field, apricot-ochraceous or olivaceous when mature; hyphal system monomitic, hyphae nodose-septate; leptocystidia fusoid or hyphoid; basidia utriculate, 4-spored, with a basal clamp connection; basidiospores ellipsoid-cylindric, with smooth one-layered brownish wall, CB+, strongly dextrinoid; on coniferous wood of various conditions or lichens thalli, causes a brown rot of the wood.

From type species of *Leucogyrophana* (*Hygrophoropsidaceae*) differs by predominance of nodose-septate hyphae and brown-walled small ellipsoid basidiospores with strong dextrinoid reaction.

Etymology: the genus named in honor of Reijo Penttila, a great connoisseur of boreal forests biota.

Type: *Penttilamyces romellii* (Ginns) Zmitr., Kalinovskaya et Myasnikov comb. nov. (IF 556848); basionym: *Leucogyrophana romellii* Ginns, Can. J. Bot. 56(16): 1968, 1978.

Other species: *Penttilamyces lichenicola* (Thorn, Malloch et Ginns) Zmitr., Kalinovskaya et Myasnikov comb. nov. (IF 556849), basionym: *Leucogyrophana lichenicola* Thorn, Malloch et Ginns, Can. J. Bot. 76(4): 687, 1998; *Penttilamyces olivascens* (Berk. et

M.A. Curtis) Zmitr., Kalinovskaya et Myasnikov comb. nov. (IF 556850), basionym: *Corticium olivascens* Berk. et M.A. Curtis, Grevillea 1(no. 12): 179, 1873.

II. HYGROPHOROPSIDACEAE Kühner, Bull. mens. Soc. Linn. Lyon 49(num. spec.): 900, 1980.

Wood-inhabiting, litter-inhabiting or ectomycorrhizal; clitocyboid or meruloid, hyphae with oculate clamp connections, basidia clavate, basidiospores dextrinoid.

1. Hygrophoropsis (J. Schröt.) Maire ex Martin-Sans, L'Empoisonnem. Champ.: 99, 1929.

Basidiomata annual, orthotropic, clitocyboid, of angiocarpous development, with concave matured cap and rather elegant central stem with decurrent anastomosed lamellate hymenophore of apricot-rufous tints; pileipellis a trichoderm tending to collapse into the cutis, subtomentose when young, pelliculose-deliquescent when old; hyphal system monomitic, hyphae with oculate clamp connections; leptocystidia as pleurocystidia, of fusoid appearance; basidia clavate, 4-spored, with a basal clamp connection; basidiospores ellipsoid-ovoid, with smooth one-layered brownish wall, CB+, dextrinoid; on forest litter and wood debris, causes a brown rot; facultative ectomycorrhizal.

Type: *Agaricus aurantiacus* Wulfen in Jacquin, Miscell. Austriac. 2: 107, 1781.

Species boreales: *Hygrophoropsis aurantiaca* (Wulfen) Maire, L'Empoisonnem. Champ.: 99, 1921; *H. fuscoscquamula* P.D. Orton, Trans. Br. mycol. Soc. 43(2): 245, 1960; *H. macrospora* (D.A. Reid) Kuyper, Persoonia 16(2): 231, 1996; *H. rufa* (D.A. Reid) Knudsen in Knudsen et Vesterholt, Funga Nordica: 913, 2008.

2. Leucogyrophana Pouzar, Česká Mykol. 12(1): 32, 1958.

Basidiomata annual, multipileate to resupinate, orbicular and adhering the substrate, with byssoid margin and subiculum; abhymenial surface a trichodermis transformed into obscure cutis;

hymenophore as ceraceous to subgelatinose merulioid field, apricot-orange when mature; hyphal system monomitic, hyphae with oculate clamp connections; leptocystidia absent or of fusoid appearance; basidia clavate, 4-spored, with a basal clamp connection; basidiospores short cylindric, with smooth one-layered prominent wall, CB+, weakly dextrinoid; on coniferous wood of various conditions or forest litter, causes a brown rot.

Type: *Merulius molluscus* Fr., Syst. Mycol. 1: 329, 1821. $\equiv$ *Leucogyrophana mollusca* (Fr.) Pouzar, Česká Mykol. 12(1): 33, 1958.

Monotypic genus.

III. **PAXILLACEAE** Lotsy, Vortr. bot. Stammesgesch. 1: 706, 1907.

Wood-inhabiting, litter-inhabiting or ectomycorrhizal; lepidoid, phylloporoid, merulioid, or gasteroid; hyphae with oculate clamp connections, basidia clavate to pedunculate, basidiospores dextrinoid.

1. **Alpova** C.W. Dodge, Ann. Mo. bot. Gdn 18: 461, 1931.

Basidiomata annual, hypogeous, *Tuber*-like to carcinoma-like, without an external stem; peridium two-layered, cream to pale, rather thin; gleba lacunar, cinnamon to umber-brown; hyphae rarely septate, with clamp connections, gleoplerous insertions and sphaerocysts; basidia clavate-pedunculate, 4-spored, with a basal clamp connection; basidiospores fusoid, with smooth one-layered brownish wall, CB+, IKI-; growth under the ground, ectomycorrhizal.

Type: *Alpova cinnamomeus* C.W. Dodge, Ann. Mo. bot. Gdn 18: 461, 1931.

Extraboreal genus.

2. **Gyrodon** Opat., Arch. Naturgesch. 2(1): 5, 1836.

Basidiomata annual, orthotropic, of pilangiocarpous development, with concave matured cap and rather short central stem with decurrent poroid hymenophore of bright-yellow to blue-gray tints; pileipellis a cutis, felty when young, pelliculose-deliquescent

when old; hyphal system monomitic, hyphae swollen, with oculate clamp connections; leptocystidia as pleurocystidia, of fusoid or hyphoid appearance; basidia clavate, 4-spored, with a basal clamp connection; basidiospores ovoid, with smooth one-layered brownish wall, CB+, dextrinoid; on soil, ectomycorrhizal; within strong rhizomorphs and sterile films blackish sclerotia can be scattered.

Type: *Boletus sistotremoides* Fr., Observ. mycol. 1: 120, 1815.

Species boreales: *Gyrodon adisianus* Singer, Fieldiana, Bot. 21: 123, 1989; *G. bohemicus* (Velen.) Beck, Z. Pilzk., N.F. 2: 142, 1923; *G. housei* (Murrill) Snell, Mycologia 33(4): 422, 1941; *G. lividus* (Bull.) Sacc., Syll. fung. 6: 52, 1888; *G. miretipes* Heinem. et Rammeloo, Bull. Jard. Bot. natn. Belg. 53(1/2): 295, 1983; *G. tennesseensis* (Snell et A.H. Sm.) Snell et Hesler, Mycologia 33(4): 422, 1941.

3. **Hydnomerulius** Jarosch et Besl, Pl. Biol. 3(4): 447, 2001.

Basidiomata annual, resupinate, orbicular and adhering the substrate, with byssoid cordonic margin and subiculum; within the subiculum and a sterile films blackish sclerotia can be scattered; hymenophore as ceraceous hydroid-merulioid field, greenish-citric to olivaceous when mature; hyphal system monomitic, hyphae with rare clamp connections; leptocystidia absent or of fusoid appearance; basidia clavate, 4-spored, with a basal clamp connection; basidiospores short cylindric, with smooth one-layered prominent wall, CB+, weakly dextrinoid; on coniferous wood of various conditions or forest litter, causes a brown rot.

Type: *Hydnum pinastri* Fr., Novit. fl. svec. 2: 38, 1814. $\equiv$ *Hydnomerulius pinastri* (Fr.) Jarosch et Besl, Pl. Biol. 3(3): 448, 2001.

Monotypic genus.

4. **Meiorganum** R. Heim, C. R. hebd. Séanc. Acad. Sci., Paris 261: 1720, 1966.

Basidiomata annual, pileate to resupinate with a dorsal attachment, growing as large patches adhering the substrate; abhymenial layer a trichoderm tending to transformation into obscure cutis; hymenophore as subgelatinose merulioid field, hyaline with

isabelline, rufous, or yellowish-brown tints; hyphal system monomitic, hyphae swollen, with oculate clamp connections; leptocystidia fusoid or absent; basidia clavate, 4-spored, with a basal clamp connection; basidiospores ellipsoid or amygdaloid, with smooth 2-layered vinaceous-brown wall, CB+, dextrinoid; on wood of tropical trees, causes a brown rot.

Type: *Meiorganum neocaledonicum* R. Heim, Revue Mycol., Paris 31(2): 157, 1966.

Extraboreal genus.

5. **Melanogaster** Corda in Sturm, Deutschl. Fl., 3 Abt. (Pilze Deutschl.) 3(11): 1, 1831.

Basidiomata annual, hypogeous, globose to subturbinate, sometimes irregularly lobed or slightly flattened, occasionally laterally confluent, with basal mycelial cords; peridium distinct, initially ochraceous, pale greenish yellow to mustard yellow, then fuscous brown, often cracking; gleba lacunar, yellowish soon reddish fuscous to purplish black; chambers fairly regular; hyphal system monomitic, hyphae with clamp connections; basidia clavate-pedunculate, 4-spored, with a basal clamp connection; basidiospores fusoid, with smooth one-layered brownish wall, CB+, IKI–; growth under the ground, ectomycorrhizal.

Type: *Melanogaster tuberiformis* Corda in Sturm, Deutschl. Fl., 3 Abt. (Pilze Deutschl.) 3(11): 1, 1831.

Species boreales: *Melanogaster broomeanus* Berk. in Tul. et C. Tul., Ann. Mag. nat. Hist., Ser. 1 10: 377, 1843; *M. macrosporus* Velen., České Houby 4–5: 808, 1922.

6. **Paragyrodon** (Singer) Singer, Annls mycol. 40(1/2): 25, 1942.

Basidiomata annual, orthotropic, of pilangiocarpous development, with concave matured cap and rather short central stem with slightly decurrent poroid hymenophore of lemon-yellow tints developing under partial veil; pileipellis a cutis, felty when young, pelliculose-deliquescent when old; hyphal system monomitic, hyphae swollen, with oculate clamp connections; leptocystidia as

pleurocystidia, of fusoid-ventricose appearance; basidia clavate, 4-spored, with a basal clamp connection; basidiospores subglobose, with smooth one-layered brownish wall, CB+, weakly dextrinoid; on soil, ectomycorrhizal.

Type: *Boletus sphaerosporus* Peck, Bull. Torrey bot. Club 12(4): 33, 1885. = *Paragyrodon sphaerosporus* (Peck) Singer, Annls mycol. 40(1/2): 25, 1942.

Monotypic genus.

7. **Paxillus** Fr., Fl. Scan.: 339, 1836.

Basidiomata annual, orthotropic, lepidoid, of pilangiocarpous development, with concave matured cap and rather short central stem with decurrent anastomosed lamellate hymenophore of yellow-brown tints (lamellae forked, lamellulae of two-three ranks); pileipellis a trichoderm tending to collapse into the cutis, felty when young, pelliculose-deliquescent when old; hyphal system monomitic, hyphae swollen, with oculate clamp connections; lepidocystidia as pleurocystidia, of fusoid or hyphoid appearance; basidia clavate, 2–4-spored, with a basal clamp connection; basidiospores ellipsoid-ovoid to amygdaloid or almost fusoid, with smooth 1–2-layered brownish wall, CB+, dextrinoid; on soil and over wood, ectomycorrhizal; in culture is capable to oxidize cellulose by Fenton mechanism.

Type: *Agaricus involutus* Batsch, Elench. fung.: 39, 1786.

Species boreales: *Paxillus albidulus* Šutara, Česká Mykol. 45(4): 129, 1992; *P. ammoniavirescens* Contu et Dessì, in Dessì et Contu, Micol. Veg. Medit. 13(2): 123, 1999; *P. cuprinus* Jargeat, Gryta, J.-P. Chaumeton et Vizzini in Jargeat, Chaumeton, Navaud, Vizzini et Gryta, Fungal Biology 118(1): 26, 2014; *P. involutus* (Batsch) Fr., Epicr. syst. mycol.: 317 1838; *P. obscurisporus* C. Hahn in Hahn et Agerer, Nova Hedwigia 69(1–2): 268, 1999; *P. rubicundulus* P.D. Orton, Notes R. Bot. Gdn Edinb. 29: 110, 1969; *P. validus* C. Hahn in Hahn et Agerer, Nova Hedwigia 69(1–2): 261, 1999; *P. vernalis* Watling, Notes R. Bot. Gdn Edinb. 29(1): 60, 1969; *P. zerovae* Wasser, Ukr. bot. Zh. 30(5): 667, 1973.

IV. **SERPULACEAE** Jarosch et Bresinsky in Jarosch, *Bibliothca Mycol.* 191: 90, 2001.

Wood-inhabiting, litter-inhabiting or ectomycorrhizal; clitocyboid, merulioid, or gasteroid; hyphae with oculate clamp connections, basidia clavate to utriculate, basidiospores weakly dextrinoid to indextrinoid.

1. **Austropaxillus** Bresinsky et Jarosch, *Pl. Biol.* 1(3): 331, 1999.

Basidiomata annual, orthotropic, clitocyboid, of gymnocarpous development, with concave (when old funnel-shaped) cap and a central stem with decurrent anastomosed lamellate hymenophore of yellow-brown tints (lamellae forked, lamellulae of two-three ranks); pileipellis a trichoderm tending to collapse into the cutis; hyphal system sarcomonitic, hyphae swollen, with oculate clamp connections; leptocystidia as pleurocystidia, of fusoid appearance; basidia clavate, 4-spored, with a basal clamp connection; basidiospores ellipsoid to fusoid, with smooth one-layered brownish wall, CB+, weakly dextrinoid; on soil, ectomycorrhizal.

Type: *Agaricus statuum* Speg., *Boln Acad. nac. Cienc. Córdoba* 11(2): 146 (1887). $\equiv$ *Austropaxillus statuum* (Speg.) Bresinsky et Jarosch, in Bresinsky, Jarosch, Fischer, Schönberger et Wittmann-Bresinsky, *Pl. Biol.* 1(3): 332, 1999.

Extraboreal genus.

2. **Gymnopaxillus** E. Horak in Horak et Moser, *Nova Hedwigia* 10: 335, 1966.

Basidiomata annual, hypogeous, *Tuber*-like to irregular, mostly without an external stem; peridium bright-whitish to cinnamonous, rather thin, subcostate; gleba columnar, dendroid or irregular, cinnamon to ferrugineous-brown, columella whitish; hyphae rarely septate, with clamp connections; basidia clavate-pedunculate, 4-spored, with a basal clamp connection; basidiospores lacrymoid to fusoid, with smooth one-layered brownish wall, CB+, IKI–; growth under the ground, ectomycorrhizal.

Type: *Gymnopaxillus morchelliformis* E. Horak Nova Hedwigia 10: 335, 1966.

Extraboreal genus.

3. **Meruliporia** Murrill, Mycologia 34(5): 596, 1942.

Basidiomata annual, pileate to resupinate with a dorsal attachment or totally effused, porioid, with cordonic and rhizomorphic margin and subiculum; hymenophore as ceraceous merulioid field or true poroid, cinnamon or ochraceous, almost black when old; hyphal system monomitic to dimitic in rhizomorphs; generative hyphae with oculate clamp connections, fibrohyphae subsolid, CB+; cystidia absent; basidia utriculate, 4-spored, with a basal clamp connection; basidiospores ellipsoid-ovoid, with 1–2-layered brownish wall, CB+, IKI–; on wood of various states, causes a brown rot.

Type: *Merulius incrassatus* Berk. et M.A. Curtis, Hooker's J. Bot. Kew Gard. Misc. 1: 234, 1849. ≡ *Meruliporia incrassata* (Berk. et M.A. Curtis) Murrill, Mycologia 34(5): 596, 1942.

Other species: *Meruliporia pulverulenta* (Sowerby) Zmitr., Kalinovskaya et Myasnikov comb. nov. (IF 556851), basionym: *Auricularia pulverulenta* Sowerby, Col. fig. Engl. Fung. Mushr. 2(17): tab. 214, 1799.

4. **Serpula** (Pers.) Gray, Nat. Arr. Brit. Pl. 1: 637, 1821.

Basidiomata annual, pileate to resupinate with a dorsal attachment or totally effused, growing as large patches adhering the substrate or pelliculose films, with cordonic and rhizomorphic margin and subiculum; abhymenial layer a trichoderm tending to transformation into obscure cutis; hymenophore as subgelatinose merulioid field, hyaline with isabelline, rufous, ferrugineous, ochraceous tints, hymenophoral growth ageotropic; hyphal system monomitic to dimitic in rhizomorphs; generative hyphae with oculate clamp connections, fibrohyphae subsolid, CB+; cystidia absent; basidia utriculate, 4-spored, with a basal clamp connection; basidiospores ellipsoid-ovoid, with 1–2-layered brownish wall, CB+, IKI–; on wood of various states, causes a brown rot.

Type: *Merulius destruens* Pers., Syn. meth. fung. 2: 496, 1801.
Species boreales: *Serpula himantoides* (Fr.) P. Karst., Meddn Soc. Fauna Flora fenn. 11: 137, 1884; *S. lacrymans* (Wulfen) J. Schröt. in Cohn, Krypt.-Fl. Schlesien 3(25–32): 466, 1888.

V. **TAPINELLACEAE** C. Hahn, Sendtnera 6: 122, 1999.

Wood-inhabiting; pleurotoid, tyromycetoid or merulioid; hyphae with medallion or oculate clamp connections, basidia clavate subpedunculate, basidiospores dextrinoid.

1. **Bondarcevomyces** Parmasto in Parmasto et I. Parmasto, Mycotaxon 70: 219, 1999.

Basidiomata annual, of tyromycetoid habitus, clustered, orange then pale with olivaceous hues; abhymenial surface felty, of trichodermoid appearance; hymenophore as a single tube layer with small pores which initially have a merulioid appearance, golden-green to obscure-olivaceous; hyphal system monomitic; generative hyphae with oculate clamp connections; cystidia absent; basidia clavate, subpedunculate, 4-spored, with a basal clamp connection; basidiospores ellipsoid, with prominent golden wall, CB+, dextrinoid; on fallen logs and stumps of coniferous trees (presumably *Taxus*), causes a brown rot.

Type: *Hapalopilus taxi* Bondartsev, Botan. Mater. Otdela Spоровykh Rastenii, Bot. Inst. Akad. Nauk SSSR 5(1–3): 17, 1940. ≡ *Bondarcevomyces taxi* (Bondartsev) Parmasto in Parmasto et I. Parmasto, Mycotaxon 70: 222, 1999.

Monotypic genus.

2. **Pseudomerulius** Jülich, Persoonia 10(3): 330, 1979.

Basidiomata annual, pileate to resupinate with a dorsal attachment; abhymenial surface felty, of trichodermoid appearance; hymenophore as ceraceous merulioid field, golden-yellow, egg-yellow, or apricot-orange; hyphal system monomitic; generative hyphae with a medallion clamp connections; cystidia absent; basidia clavate, subpedunculate, 4-spored, with a basal clamp connection; basidiospores ellipsoid, cylindric to subballantoid, with

prominent hyaline wall, CB+, dextrinoid; on fallen logs and stumps of coniferous trees, causes a brown rot.

Type: *Merulius aureus* Fr., Observ. mycol. 1: 101, 1815.

Species boreales: *Pseudomerulius aureus* (Fr.) Jülich, Persoonia 10(3): 330, 1979; *P. curtisii* (Berk.) Redhead et Ginns, Trans. Mycol. Soc. Japan 26(3): 372, 1985; *P. elliottii* (Masse) Jülich, Persoonia 10(3): 330, 1979; *P. montanus* (Burt) Kotir., K.H. Larss. et M. Kulju in Kotiranta, Larsson, Saarenoksa et Kulju, Ann. bot. fenn. 48(1): 45, 2011.

3. *Tapinella* E.-J. Gilbert, Les Livres du Mycologue Tome I–IV, Tom. III: Les Bolets: 67, 1931.

Basidiomata annual, pleurotoid, pileate to subresupinate with a dorsal attachment or differentiated into the pileus and strong hispid lateral stem; abhymenial surface a trichodermis transforming into the cutis; hymenophore lamellate with forked lamellae (lamellulae of 2–3 ranks) or meruloid fields near the base, creamish, citric-yellow, golden-yellow to olivaceous-brown when old; hyphal system sarcomonomitic; generative hyphae with oculate clamp connections; leptocystidia as pleurocystidia of fusoid or hyphoid appearance; basidia clavate, subpedunculate, 4-spored, with a basal clamp connection; basidiospores ellipsoid-cylindric, with prominent golden wall, CB+, dextrinoid; on fallen logs and stumps of coniferous trees, causes a brown rot.

Type: *Agaricus panuoides* Fr., Observ. mycol. 2: 227, 1818.

Species boreales: *Tapinella atrotomentosa* (Batsch) Šutara, Česká Mykol. 46(1–2): 50, 1992; *T. panuoides* (Fr.) E.-J. Gilbert, Les Livres du Mycologue Tome I–IV, Tom. III: Les Bolets: 68, 1931; *T. polychroa* (Singer) C. Hahn, Mycol. Bavarica 13: 64, 2012.

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TABLES I-XXXII

Table I



Coniophora arida:
NW Russia, Dubki, fallen *Picea abies* (above),
Kovkenitsy vic., fallen *Pinus sylvestris* (below).

Table II



Coniophora puteana:
NW Russia, Vaskelovo, *Betula pubescens* stump (above); Tarkhovka, fallen
Pinus sylvestris (below).

Table III



Coniophora puteana:
NW Russia, Dubki, fallen *Quercus robur* (above); ibid., Razliv, fallen *Populus tremula* (below).

Table IV



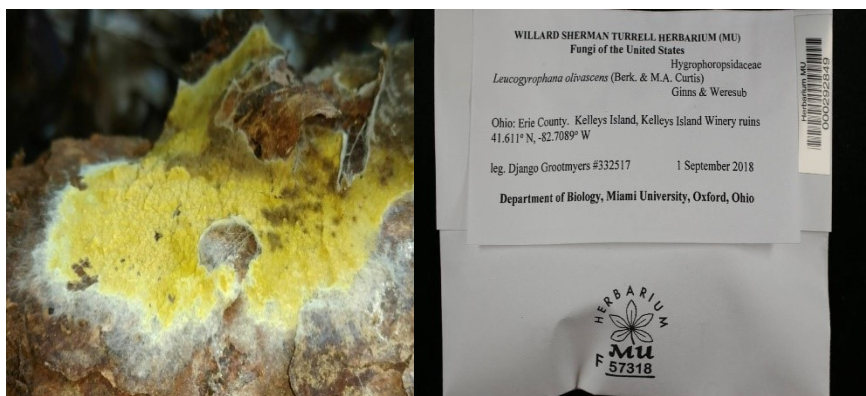
Coniophora olivacea:
NW Russia, Dubki, fallen *Pinus sylvestris*.

Table V



Penttilamyces romellii:
NW Russia, Kovkenitsy vic., fallen *Pinus sylvestris*.

Table VI



Penttilamyces romellii: NW Russia, Kovkenitsy vic., fallen *Pinus sylvestris* (above); *P. olivascens* (below: <http://mycoportal.org/portal/taxa/index.php?taxon=149017>).

Table VII



Hygrophoropsis aurantiaca:
NW Russia, Vyborg vic., *Betula pubescens* debris.

Table VIII



Hygrophoropsis aurantiaca:
NW Russia, Razliv vic., forest litter.

Table IX



Leucogyrophana mollusca:
NW Russia, Razdolye, fallen *Picea abies*.

Table X



Leucogyrophana mollusca:
NW Russia, Razdolye, fallen *Picea abies*.

Table XI



Leucogyrophana mollusca:
NW Russia, Kovkenitsy, fallen *Pinus sylvestris*.

Table XII



Leucogyrophana mollusca:
NW Russia, Kirillovskoye, dry *Pinus sylvestris*.

Table XIII



Leucogyrophana mollusca:
NW Russia, Zelenogorsk vic., coniferous debris.

Table XIV



Gyrodon lividus:
NW Russia, Vyritsa, under *Alnus incana*.

Table XV



Hydnomerulius pinastri:
NW Russia, Roshchino, fallen *Pinus sylvestris*.

Table XVI



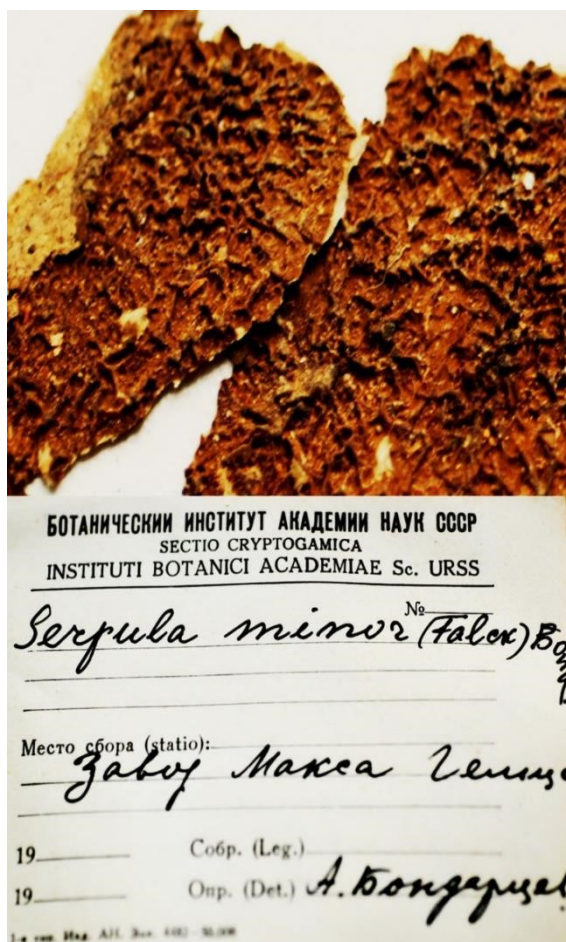
Paxillus involutus:
NW Russia, St. Petersburg, under *Betula pendula* (above); ibid., Olgino,
under *B. pendula* (below).

Table XVII



Paxillus rubicundulus:
NW Russia, St. Petersburg, under *Quercus robur*.

Table XVIII



Meruliporia pulverulenta (LE 166635):
 NW Russia, St. Petersburg, timber wood.

Table XIX



Serpula himantoides:
NW Russia, Zelenogorsk vic., fallen *Pinus sylvestris*.

Table XX



Serpula himantioides:
NW Russia, Dubki, fallen *Betula pubescens*.

Table XXI



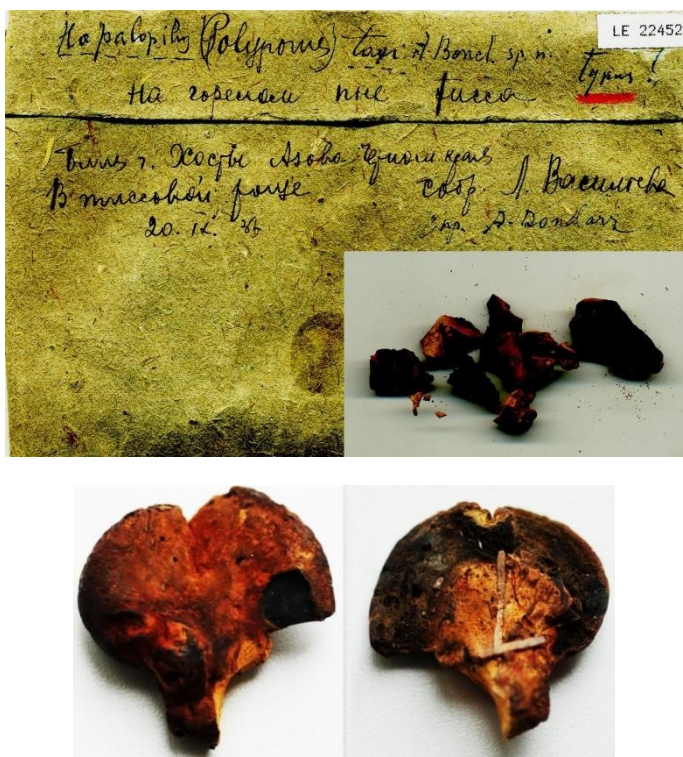
Serpula himantioides:
NW Russia, Roshchino, fallen *Larix sibirica*.

Table XXII



Serpula lacrymans:
NW Russia, Bashovo, timber wood (above); ibid., Peterhoff, timber wood
(below).

Table XXIII



Bondarcevomyces taxi:

Type specimen (material is poorly kept), Caucasus, Khosta river canyon, *Taxus baccata* stump (above); Russian Far East, Big Hechtsir Range, *Abies sibirica* stump.

Table XXIV



Pseudomerulius aureus:
NW Russia, Smolyachkovo, fallen *Pinus sylvestris*.

Table XXV



Pseudomerulius aureus:
NW Russia, Tarkhovka, fallen *Picea abies*.

Table XXVI



Tapinella atrotoментosa:
NW Russia, Pochinok, *Pinus sylvestris* buried wood (above); *ibid.*,
Lembolovo, *P. sylvestris* buried wood (below).

Table XXVII



Tapinella atrotomentosa:
NW Russia, Krugloye lake vic., *Pinus sylvestris* buried wood.

Table XXVIII



Tapinella panuoides:
NW Russia, Svirskeye, on the base of living *Pinus sylvestris*.

Table XXIX



Tapinella panuoides:
NW Russia, Vaskelovo, timber wood.

Table XXX



Tapinella panuoides:
Crimea, Ai-Petri foot, dry *Pinus nigra* ssp. *pallasiana*.

Table XXXI



Tapinella panuoides:
Crimea, Ai-Petri foot, dry *Pinus nigra* ssp. *pallasiana*.

Table XXXII



Tapinella panuoides:
Crimea, Ai-Petri foot, dry *Pinus nigra* ssp. *pallasiana*.

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--- A new Polyporaceae book ---

**Zmitrovich IV (2018) *Conspectus systematis Polyporacearum* v. 1.0.
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The system of the family *Polyporaceae* is presented and the overview of the order *Polyporales* is carried out. The family *Polyporaceae* s. str. was subdivided into three subfamilies, *Polyporoideae*, *Trametoideae*, and *Lopharioideae*. The largest subfamily *Polyporoideae* was subdivided into the tribes *Polyporeae*, *Epitheleae* (trib. nov.), *Lentineae*, and *Ganodermateae*. In the *Polyporaceae* family, two new genera were described as *Pilatotrama* and *Szczepkamyces*. Such subgenera as *Cerioporus* subgen. *Datronia*, *Lentinus* subgen.

Polyporellus, *Ganoderma* subgen. *Haddowia*, *Ganoderma* subgen. *Humphreya* were informally described too. In the *Polyporales* order overview, such families as *Ischnodermataceae*, *Incrustoporiaceae*, large *Fomitopsidaceae*, *Gelatoporiaceae*, *Grifolaceae*, *Polyporaceae*, and large *Meruliaceae* were recognized. In the *Polyporales* overview, a range of new genera was described as *Gloeoporellus* (*Incrustoporiaceae*), *Ranadivia* (*Fomitopsidaceae*), *Cinereomycetella* (*Gelatoporiaceae*), *Efibulella*, *Hermanssonia*, *Pappia*, *Resiniporus*, *Trullella*, *Vitreoporus* (*Meruliaceae*). In total, 85 new combinations were made. The problem of taxa ranking in the *Polyporales* was proposed for further theoretical discussion.



L. V. ZMITROVICH

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